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INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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QIN, YIXING

ART UNIT	PAPER NUMBER
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2625

NOTIFICATION DATE	DELIVERY MODE
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ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	Application No. 10/627,178	Applicant(s) GREEN ET AL.	
	Examiner Yixing Qin	Art Unit 2625	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 7-13, 16-23, 28 and 29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7-13, 16-23, 28 and 29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 11/20/07 have been fully considered but they are not persuasive. The main argument is that the Sakuma reference does not perform the claimed invention in any mode dealing with graphics. However, a secondary reference, Narendranath (U.S. Patent No. 5,751,434) discloses Fig. 1, Fig. 5 and column 6, lines 47-60 that there are various TRCs that represent density curves for printing images, text or graphics. Fig. 5 shows how users can vary the densities to perform reduced density printing for text, images or graphics. Sakuma focuses on images and text, while Narendranath discloses that techniques can be applied to images, text or graphics. Thus, a combination of the two references would suggest the claimed invention, since it would be applying the same techniques to an additional type of data that can be printed, which in this case is graphics.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7-13, 16-23, 28, and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma (U.S. Patent No. 5,663,750) in view of Narendranath (U.S. Patent No. 5,751,434)

Regarding claim 1, Sakuma discloses a computer readable medium containing code for controlling operation of a processor associated with a printing device, the code being executable to perform a method comprising:

operating the printing device for printing on a print medium in a primary mode in which the printing device consumes toner at a given rate, from a supply of the toner; (normal mode, column 2, lines 39-59. Would be inherent that the normal mode has an arbitrary given rate since the cited lines disclose a savings mode and another mode that uses less ink than the savings mode, both of which have lower rates than the normal mode. )

Sakuma disclose a savings mode, and a mode that outputs less than a savings mode for text or image data, but just not necessarily graphics data.

Sakuma does not explicitly disclose "operating the printing device in a selected one of a plurality of secondary print modes for printing on a print medium, the secondary print modes consuming the toner at different rates lower than the given rate associated with the primary print mode of the printing device, the plurality of secondary print modes including a graphics only mode, wherein the rate of toner consumption only for graphics image data is reduced; "

However, Narendranath discloses in column Fig. 1, Fig. 5 and column 6, lines 47-60 that there are various TRCs that can be used to adjust the density of text, graphics or image data. Graphics, in addition to text or images, is another commonly known classification of objects in a printed document. Narendranath discloses in Fig. 5 that one can vary densities for any of the three classifications to perform draft printing, which uses lower amounts of ink. Sakuma basically focuses on two of the three classifications, text and images, but combined with Narendranath, it would have been obvious that one can apply similar techniques to graphics data as well.

Sakuma and Narendranath are combinable because both are in the art of saving toner for printing documents.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have improved Sakuma to handle additional types of objects in a printed document.

The motivation would have been to provided more flexibility in the type of data that can be processed, and thus enable the Sakuma invention to handle more types of documents.

Therefore, it would have been obvious to combine Sakuma and Narendranath to obtain the invention as specified.

and

switching operation of the printing device into a selected one of said plurality of secondary print modes so as to reduce a current rate of consumption of the toner as the supply of the toner is used. (column 2, lines 44-62)

Regarding claim 2, Sakuma discloses the computer readable medium of claim 1, wherein the code further controls operation of the processor for:

associating ones of said secondary print modes having successively lower rates of consumption with successively lower levels of the supply of the toner; (column 2, lines 44-62)

responding to at least one input that changes as the level of the toner drops below a corresponding one of said successively lower levels; (column 2, lines 39-59 – signals are used to control the rate at which ink drops, so the signals would be the input that changes the rate) and

wherein said switching into said selected one of said secondary print modes is responsive to a change in the input indicating that the level of the toner has dropped below a threshold related to the corresponding one of said successively lower levels. (column 2, line 63-column 3, line 7)

Regarding claims 3, 12, Sakuma discloses wherein the code further controls operation of the processor such that said switching operation selects a secondary print mode configured to consume toner at a rate lower than a rate of the current print mode only for graphics regions; (again, Sakuma discloses varying the mode for text or images, but as seen in Fig. 5 of Narendranath, one can slide the bar for any of the three classifications. By leaving images and text at 100% and varying the bar for graphics to

below 100%, this effectively only changes the density of printing for graphics, and thus the toner consumption rate for printing graphics)

Regarding claims 4, 13, the secondary reference, Narendranath, discloses wherein when the graphics only secondary print mode is selected, the selected ,graphics only print mode is configured to consume toner at a rate lower than the current print mode for only graphics regions by modifying dither patterns to reduce consumption of toner used to print a same said graphics region in the selected secondary print mode versus the current print mode. (again, Sakuma discloses varying the mode for text or images, but as seen in Fig. 5 of Narendranath, one can slide the bar for any of the three classifications. By leaving images and text at 100% and varying the bar for graphics to below 100%, this effectively only changes the density of printing for graphics, and thus the toner consumption rate for printing graphics)

Regarding claims 7, 16, the secondary reference Narendranath discloses the first selected one of said secondary print modes is configured to have progressively decreased consumption of toner comprises a mode which reduces consumption of toner for graphics only information and wherein a subsequent selected one of said secondary print modes comprises a mode which reduces consumption of toner for graphics information and text information. (as seen in Fig. 5, one can vary density of any combination of image, text and graphics. By setting images to 100% and varying

graphics and text, this effectively emulates the claimed reduced mode for graphics and text)

Regarding claims 8, 17, Sakuma discloses wherein the code controls operation of the processor to alter application of at least one of a particulate powder contrast forming composition and a liquid ink contrast forming composition forming said toner. (column 2, lines 44-62)

Regarding claim 9, Sakuma discloses an encoded medium containing code for controlling operation of a digital processor associated with a printing device, the processor managing application of a toner comprising a contrast forming composition, from a supply of the toner that can be exhausted by continued printing, wherein the processor is constrained by the code to perform the steps of:

varying a rate of toner consumption in the printing device, among a primary print mode in which the toner is consumed at a given rate, and a hierarchy of secondary print modes, each mode consuming a different amount of toner in printing predetermined image data, each said different amount being less than an amount consumed in the primary print mode, said hierarchy of print modes ranging in order from a mode having a greatest rate of toner consumption to a mode having a least rate of toner consumption, said hierarchy of print modes including a graphics only mode, wherein the rate of toner consumption only for graphics images is reduced; (column 2, lines 44-62 – normal mode is the primary mode, then savings mode and the mode using less toner than the

savings mode are the secondary modes. Also see in claim 1, the description of Figs 1 and 5 of Narendranath.)

associating predetermined levels of toner with corresponding modes of said hierarchy of secondary print modes; (column 2, line 63-column 3, line 7)

receiving print requests; (column 4, lines 39-44) and

switching from a current print mode to one of said secondary print modes in response to a determination that a current level of toner has dropped below one of said predetermined levels, whereby each successive print mode switched to in said hierarchy in response to said print requests exhibits progressively decreased consumption of toner. (column 2, line 63-column 3, line 7)

Regarding claim 10, Sakuma discloses a method for controlling consumption of toner in a printing device having a supply of the toner, the printing device having a primary print mode at which the toner is consumed at a given rate, the method comprising:

providing a plurality of secondary print modes for printing on a print medium, configured to consume the toner at different rates lower than the given rate associated with the primary print mode of the printing device, the plurality of secondary print modes including a ,graphics only mode, wherein the rate of toner consumption only for graphics image data is reduced; an; (column 2, lines 44-62 – normal mode is the primary mode, then savings mode and the mode using less toner than the savings mode are the

secondary modes. Also see in claim 1, the description of Figs 1 and 5 of Narendranath) and

switching operation of the printing device into a selected one of said plurality of secondary print modes so as to reduce a current rate of consumption of the toner as the supply of the toner is used. (column 2, line 63-column 3, line 7)

Regarding claim 11, Sakuma discloses the method of claim 10, further comprising:

associating ones of said secondary print modes having successively lower rates of consumption with successively lower levels of the supply of the toner; (column 2, lines 44-62)

detecting when the level of the toner has dropped below a corresponding one of said successively lower levels; (column 2, lines 44-62) and

wherein said switching into said selected one of said secondary print modes is done in response to said detecting when the level of the toner has dropped below a threshold related to the corresponding one of said successively lower levels. (column 2, lines 44- column 3, line 7)

Regarding claim 18, Sakuma discloses a printing device having reduced toner consumption modes comprising:

a print processor responsive to an input signal for printing information on a print medium by application of toner from a supply; (column 2, lines 6-15)

memory for storing a hierarchy comprising a primary print mode and a plurality of secondary print modes, each mode in said hierarchy configured to consume progressively less toner to print a given image, whereby each of said modes consumes the toner at a progressively lower rate than the primary print mode of the printing device and wherein said hierarchy of print modes including a graphics only mode, wherein the rate of toner consumption only for graphics images is reduced; (column 2, lines 44 - column 3, line 7. Also see in claim 1, the description of Figs 1 and 5 of Narendranath)

at least one detector for detecting when a level of toner in the supply drops below a given one of a plurality of threshold values and for generating a control signal in response thereto; (column 2, lines 44 - column 3, line 7)

wherein said processor is responsive to said control signal for switching from a current print mode to a next one of said secondary print modes in said hierarchy based on said detection. (column 2, lines 44 - column 3, line 7)

Regarding claim 19, Sakuma discloses the device of claim 18, wherein the print processor includes a graphics processor responsive to a print request for graphics data for switching dither patterns to print graphics information in a reduced toner consumption mode. (column 8, lines 14-25).

Regarding claim 20, Sakuma discloses the device of claim 18, wherein the print processor includes a text processor responsive to a print request for text data for

removing pixel data from characters to print text information in a reduced toner consumption mode. (column 8, lines 14-25).

Regarding claim 21, the Sakuma reference discloses in column 11, lines 15-19 two ways to control the thresholds.

It does not explicitly disclose "wherein said plurality of threshold levels and said hierarchy of secondary modes are configurable by a user "

However, it would be obvious that since one way is automatic, thus other way is manual control of the thresholds.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have allowed user control of the threshold levels.

The motivation would have been to allow greater customization which can better suit the needs of the users.

Therefore, it would have been obvious to improve to obtain the invention as specified.

Regarding claim 22, Sakuma discloses the device of claim 18, wherein said detector comprises a plurality of sensors disposed in said printer for sensing toner level, each sensor associated with a corresponding one of said plurality of threshold levels and operative to generate said control signal when the sensed current toner level crosses said respective threshold level. (column 11, lines 20-22 – it would be obvious to use plural sensors, since there is ability to detect multiple levels from column 2, lines

44- column 3, line 7. Even though Sakuma uses only one remaining ink detection means, it can easily be implemented as plural sensors since the functionality is disclosed.)

Regarding claim 23, Sakuma discloses the device of claim 22, wherein said plurality of level sensors are disposed within a cartridge in said printer and arranged such that, as the level of toner in the cartridge is consumed by ongoing printing, successive ones of the sensors are exposed to air, thereby generating said control signals. (the sensors above would be exposed to air because of the level of the toner drops as toner is used, leaving empty space occupied by air)

Regarding claim 28, Sakuma discloses a method for operating a printing device in a manner that varies a rate of toner consumption in the printing device, said toner comprising a contrast forming composition provided from a supply in the printing device that can be exhausted by continued printing, the printing device having a primary print mode in which the toner is consumed at a given rate, the method comprising:

establishing a hierarchy of secondary print modes, each mode consuming a different amount of toner in printing predetermined image data, each said different amount being less than an amount consumed in the primary print mode, said hierarchy of print modes ranging in order from a mode having a greatest rate of toner consumption to a mode having a least rate of toner consumption said hierarchy of print modes including a graphics only mode, wherein the rate of toner consumption only for

graphics images is reduced; (column 2, lines 44-column 3, line 7. Also see in claim 1, the description of Figs 1 and 5 of Narendranath)

associating predetermined levels of toner with corresponding modes of said hierarchy of secondary print modes; (column 2, lines 44-column 3, line 7)

receiving print requests; (column 4, lines 38-45)

and switching from a current print mode to one of said secondary print modes in response to a determination that a current level of toner has dropped below one of said predetermined levels, whereby each successive print mode switched to in said hierarchy in response to said print requests exhibits progressively decreased consumption of toner. (column 2, lines 66-column 3, line 7)

Regarding claim 29, Sakuma discloses a computer readable medium encoded with computer program code such that, when the computer program code is executed by a processor of a computer, the processor performs a method comprising:

providing a plurality of secondary print modes for printing on a print medium, configured to consume toner at different rates, the different rates being lower than a given rate of toner consumption associated with a primary print mode for printing on a print medium, said hierarchy of print modes including a graphics only mode, wherein the rate of toner consumption only for graphics images is reduced; and (column 2, lines 44-column 3, line 7. Also see in claim 1, the description of Figs 1 and 5 of Narendranath)

activating ones of said plurality of secondary print modes in response to a print request so as to reduce a current rate of consumption of toner as the supply of toner is used. (column 2, lines 44-column 3, line 7)

Claims 1-4, 7-13, 16-23, 28, and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuma (U.S. Patent No. 5,663,750) in view of Narendranath (U.S. Patent No. 5,751,434) and further in view of Partridge (U.S. Patent No. 6,058,219)

Regarding claims 5, 14, Sakuma discloses wherein the plurality of secondary print modes further includes a text only mode, wherein the rate of toner consumption only for text data is reduced, and wherein when the text only secondary print mode is selected, the selected text only print mode is configured to consume toner at a rate lower than the current print mode for only text regions (column 2, lines 3-12. Also, from Narendranath, in Fig. 5, one can vary only the text bar for a density below 100%, while leaving graphics and images at 100% to emulate that only text printing toner usage would be affected.)

It does not explicitly disclose performing this task "by character thinning to reduce consumption of toner used to print a same said text region in the selected secondary print mode versus the current print mode.

However, the tertiary reference, Partridge discloses in column Figs. 2-3, and column 3, line 55 – column 4, line 50, especially, column 4, lines 45-50, where it discloses that the "on" pixels are removed. Since pixels are removed, they are not printed using toner.

All references are combinable because they are in the art of reducing data to be printed.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have used character thinning as a method of reduction of data to be printed.

The motivation would have been to use a known technique for performing data reduction.

Therefore, it would have been obvious to combine all references to obtain the invention as specified.

Regarding claims 6, 15, the tertiary reference, Partridge discloses wherein character thinning comprises eliminating application of the toner at pixels corresponding to portions of text characters according to a given reduction algorithm (Figs. 2-3, and column 3, line 55 – column 4, line 50, especially, column 4, lines 45-50 of Partridge.)

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yixing Qin whose telephone number is (571)272-7381. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on (571)272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A large, stylized handwritten signature in black ink, appearing to read 'Twyler Lamb Haskins', with a long horizontal flourish extending to the right.

  
TWYLER LAMB HASKINS  
SUPERVISORY PATENT EXAMINER